R

CONTENTS

PREFATORY CHAPTER

The Apology of a Second-Class Man, Horace W. Davenport	1
COMPARATIVE PHYSIOLOGY	
Introduction, James E. Heath, Section Editor	15
Neural Pacemakers and Rhythmicity, John A. Connor	17
Oscillatory Neural Networks, Allen I. Selverston and Maurice Moulins	29
Circadian Neural Rhythms in Mammals, Fred W. Turek	49
Annual Rhythms, Donald S. Farner	65
RENAL AND ELECTROLYTE PHYSIOLOGY	
Introduction, Carl W. Gottschalk, Section Editor	83
Metabolic Substrates, Cellular Energy Production, and the Regulation of Proximal Tubular Transport, Lazaro J. Mandel	85
Transport of Metabolic Substrates by the Proximal Nephron, James A. Schafer and James C. Williams, Jr.	103
Transport of Carboxylic Acids by Renal Membrane Vesicles, Ernest M. Wright	127
Transport of Metabolic Substrates in Renal Mitochondria,	
Anton C. Schoolwerth and Kathryn F. LaNoue	143
GASTROINTESTINAL PHYSIOLOGY	
Introduction, John G. Forte, Section Editor	173
Growth and Development of Gastrointestinal Cells, Martin Lipkin	175
Functional Development of the Stomach, Leonard R. Johnson	199
Mechanisms for Rapid Re-Epithelialization of the Gastric	217

(continued)

vii

Ontogeny of Enzymes in the Small Intestine, Susan J. Henning	231
Expression of Digestive and Absorptive Function in Differentiating Enterocytes, M. W. Smith	247
SPECIAL TOPIC: GAP JUNCTIONS	
Introduction, David C. Spray, Special Topic Editor Chemistry of Gap Junctions, JP. Revel, B. J. Nicholson, and	261
S. B. Yancey	263
Physiology and Pharmacology of Gap Junctions, D. C. Spray and M. V. L. Bennett	281
Antibody Probes in the Study of Gap Junctional Communication, Elliot L. Hertzberg	305
The Role of Gap Junctions in Development, S. Caveney	319
Physiological Roles of Permeable Junctions: Some Possibilities, J. D. Sheridan and M. M. Atkinson	337
ENDOCRINOLOGY	
Introduction, Jack L. Kostyo, Section Editor	355
The Nature and Regulation of the Insulin Receptor: Structure and Function, Michael P. Czech	357
Uptake of Insulin and Other Ligands into Receptor-Rich Endocytic Components of Target Cells: The Endosomal Apparatus, J. J. M. Bergeron, J. Cruz, M. N. Khan, and	
B. I. Posner	383
Intracellular Mediators of Insulin Action, Kang Cheng and Joseph Larner	405
The Nature and Regulation of the Receptors for Insulin-Like Growth Factors, Matthew M. Rechler and S. Peter Nissley	425
Actions of Insulin-Like Growth Factors, E. R. Froesch, Chr. Schmid, J. Schwander, and J. Zapf	443
The Nature and Regulation of the Receptors for Pituitary Growth Hormone, J. P. Hughes and H. G. Friesen	469
Mode of Action of Pituitary Growth Hormone on Target Cells, Olle G. P. Isaksson, Staffan Edén, and John-Olov Jansson	483
CELL AND MEMBRANE PHYSIOLOGY	
Introduction, Joseph F. Hoffman, Section Editor	501
The Glucose Transporter of Mammalian Cells,	502

	Kinetics and Mechanism of Anion Transport in Red Blood Cells, Michael L. Jennings	519
	Ion Movements Through the Sodium Pump, Jack H. Kaplan	535
	Kinetic Properties of the Plasma Membrane Na ⁺ -H ⁺ Exchanger, Peter S. Aronson	545
	Sodium-Calcium Exchange in Plasma Membrane Vesicles, Kenneth D. Philipson	561
	Mechanism of Calcium Transport, Giuseppe Inesi	573
	ardiovascular Physiology	
	Introduction, Harvey V. Sparks, Jr., Section Editor	603
	Myocardial Nucleotide Transport, Michael J. Rovetto	605
	Nucleotide Metabolism by Endothelium, Jeremy D. Pearson and John L. Gordon	617
	High-Energy Phosphate Metabolism in Vascular Smooth Muscle, Thomas M. Butler and Marion J. Siegman	629
	Regulation of Mitochondrial Activity in Cardiac Cells, Leena M. Mela-Riker and Richard D. Bukoski	645
	Extracellular Functions of Nucleotides in Heart and Blood Vessels, Che Su	665
	Nucleotide Metabolism of Platelets, Holm Holmsen	677
	Purine Salvage Pathways in Myocardium, John P. Manfredi and Edward W. Holmes	691
	Respiratory Control and the Integration of Heart High-Energy Phosphate Metabolism by Mitochondrial Creatine Kinase,	
	William E. Jacobus	707
	Nucleotide Metabolism and Cellular Damage in Myocardial	
	Ischemia, Robert B. Jennings and Charles Steenbergen, Jr.	727
R	ESPIRATORY PHYSIOLOGY	
	Introduction, Robert E. Forster, II, Section Editor	751
	Histological Preservation and Ultrastructure of Alveolar Surfactant, <i>Joan Gil</i>	753
	Synthesis of Surfactant Lipids in the Adult Lung, Lambert M. G. van Golde	765
	Composition and Metabolism of the Apolipoproteins of Pulmonary Surfactant, Richard J. King	775
	Intracellular Processing of Surfactant Lipids in the Lung,	
	Aron B. Fisher and Avinash Chander	789

x CONTENTS (continued)

Developmental Aspects of Lung Lipids, Robert H. Perelman,
Philip M. Farrell, Michael J. Engle, and Joseph W. Kemnitz

803

INDEXES

Subject Index
Cumulative Index of Contributing Authors, Volumes 43–47

Cumulative Index of Chapter Titles, Volumes 43–47

852

